



22126014

**BIOLOGY  
HIGHER LEVEL  
PAPER 2**

Thursday 17 May 2012 (afternoon)

2 hours 15 minutes

Candidate session number

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Examination code

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**INSTRUCTIONS TO CANDIDATES**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer two questions.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is [72 marks].



0116

**SECTION A**

Answer ***all*** questions. Write your answers in the boxes provided.

**1.**

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*(Question 1 continued)*

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*(Question 1 continued)*

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*(Question 1 continued)*

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0516

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2. Two foods were measured with a calorimeter to determine the energy in each. Five trials on potato chips and five trials on walnuts were performed. The results are shown in the table below.

Trial	Potato chip / $\text{kJ g}^{-1}$	Walnut / $\text{kJ g}^{-1}$
1	22.4	24.1
2	21.7	23.8
3	21.9	25.2
4	22.0	28.0
5	22.0	27.9
Mean	22.0	missing value
Standard deviation	0.1	2.0

- (a) Calculate the mean energy for the walnut.

[1]

.....

- (b) Explain how this data shows which food had the greatest variation in its energy content.

[2]

.....  
 .....  
 .....  
 .....

- (c) Both potato chips and walnuts contain lipids. State **one** function of lipids.

[1]

.....  
 .....



3. (a) Blood transports molecules throughout the body. State where the blood absorbs

(i) hormones.

[1]

.....

(ii) carbon dioxide.

[1]

.....

(b) Describe **three** features of alveoli that adapt them to gas exchange.

[3]

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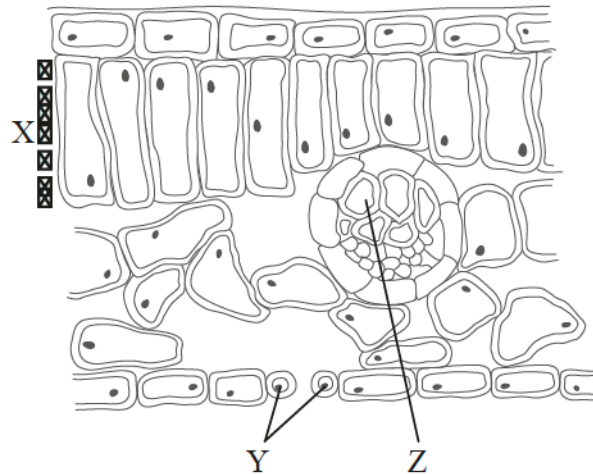
(c) Explain how the structure of capillaries relates to their functions.

[3]

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4. The diagram shows a cross section of a leaf.



- (a) Identify the tissues labelled X, Y and Z.

(i) X: ..... [1]

(ii) Y: ..... [1]

(iii) Z: ..... [1]

- (b) Outline **two** adaptations of xerophytes that help to reduce transpiration from the leaves. [2]

1. ....
2. ....

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*(Question 4 continued)*

- (c) Angiospermophyta have vascular tissue (xylem and phloem) that bryophyta lack. Suggest advantages that vascular tissue confers. [3]

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## SECTION B

Answer **two** questions. Up to two additional marks are available for the construction of your answers. Write your answers in the boxes provided.

5. (a) List the general functions of non-membrane proteins. [4]
- (b) Outline the digestion, absorption and assimilation of proteins in humans. [6]
- (c) Actin and myosin are two proteins found in muscles. Explain how skeletal muscle contracts, including the interaction of these proteins. [8]
  
6. (a) Describe the relationship between genes, polypeptides and enzymes. [4]
- (b) Outline control of metabolic pathways. [6]
- (c) Discuss the use of lactase in the production of lactose-free milk. [8]
  
7. (a) Outline pollination, fertilization and seed dispersal. [4]
- (b) Compare the processes of spermatogenesis and oogenesis. [8]
- (c) Describe the consequences of overpopulation of a species. [6]
  
8. (a) Outline how **three** properties of water enhance its use by living organisms. [6]
- (b) Describe the role of ADH in osmoregulation. [4]
- (c) Explain how water is moved from roots to leaves in terrestrial plants. [8]





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